IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	
Israel Stol et al.	)	Group Art Unit 1725
Serial No. 10/025,402	)	Attorney Docket No. 00-2521
Confirmation No. 4915	)	
Filed December 19, 2001	)	
For Friction Plunge Riveting	)	

DECLARATION

Mail Stop Non Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Israel Stol declare as follows:

1. I have B.S. and M.S. degrees in welding engineering from Ohio State University.

2. I have been a welding engineer for 25 who worked 7 years in the Westinghouse Research and Development Center and 18 years in the Alcoa Technical Center. In both companies I have carried applied and fundamental R&D in various areas of joining. In addition, I have worked as a consultant to various Westinghouse and Alcoa plants as well as their customers in the USA and Europe. Some of the joining processes that I have worked with and specialized in include: Laser- Beam welding, Electron Beam

welding, Electro-slag welding, Gas Metal Arc welding (GMAW), Gas Tungsten Arc welding (GTA), Friction welding, Friction Stir welding and mechanical fastening. During my career, I have worked with both ferrous and non- ferrous materials, which included: Titanium, Aluminum, Steel, Aluminum, Copper and Brass alloys. I hold 24 US and international patents in the area of joining and other fields.

3. I am an inventor of the subject matter of the above-identified application and am familiar with the prior art of record in the application.

4. The composition and melting point of a material do not, cannot and should not be equated with its hardness. The composition of a material merely determines how it will respond to different thermo-mechanical treatments (e.g. strain hardening, solution heat treating, artificial aging, etc.), which in turn determine its hardness and other mechanical properties (e.g. yield and ultimate strengths, ductility, toughness, etc.) Hardness of a material is directly proportional to the material's strength.

5. There are practically hundreds if not thousands of alloys whose hardnesses vary with their thermo-mechanical histories (tempers). By way of example Aluminum Association alloys AA 5652 and AA 6061 each have a specific chemical composition. However, the temper of the final alloy controls the alloy's hardness and other mechanical properties as follows:

AA Alloy	Thermo-mechanical history	Yield strength (ksi)	Ultimate yield strength (ksi)
5652-O	fully annealed	16	44
5652- H43	strain hardened	36	55
5652- H38	another strain hardened	44	60
6061- T1	cooled and naturally aged	16	34
6061- T651	solution heat treated and artificially aged	32	37

	and artificially aged		

The hardness of an alloy (AA 5652 or AA 6061) is not dependent on its composition, otherwise the alloys of AA 5652 would all have the same strength (hardness) as each other and the alloys of AA 6061 would have the same strength (hardness) as each other. Even though the alloys of one composition (e.g. AA 5652) are the same and have the same melting point, they do not have the same hardness because their tempers differ.

6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Israel Stol

8 August 2003

Date

OFFICIAL